

## **ITEM FOR FINANCE COMMITTEE**

### **CAPITAL WORKS RESERVE FUND**

#### **HEAD 710 – COMPUTERISATION**

#### **Immigration Department**

#### **New Subhead “Next Generation Application and Investigation Easy Systems”**

Members are invited to approve a new commitment of \$452,968,000 for the Next Generation Application and Investigation Easy Systems.

### **PROBLEM**

The Immigration Department (ImmD) needs to develop the Next Generation Application and Investigation Easy Systems (APPLIES-2), which include three computer systems, namely Systems related to Visa Automation (VISAS); Assistance to Hong Kong Residents, Births, Deaths and Marriage, Right of Abode Decision Support (ABROADS); and Enforcement Case Processing (ENCAPS), to replace the existing ageing Application and Investigation Easy System (APPLIES) and enhance service delivery and operational efficiency.

### **PROPOSAL**

2. The Director of Immigration, with the support of the Secretary for Security and the Government Chief Information Officer, proposes to create a new commitment of \$452,968,000 for APPLIES-2.

### **JUSTIFICATION**

#### **Ageing and obsolescence of APPLIES**

3. At present, a wide range of core businesses and services carried out by ImmD is supported by APPLIES, including the processing of –

/(a) .....

- (a) visa and permit applications of visitors or Hong Kong residents;
- (b) assistance requests from Hong Kong residents in distress outside Hong Kong;
- (c) birth, death and marriage registrations;
- (d) right of abode applications; and
- (e) enforcement and investigation cases in relation to immigration offenders, removees, deportees, etc.

4. Similar to other major computer systems, APPLIES was designed for optimal use for about ten years. Implemented by phases from 2007 to 2008, the hardware and software of APPLIES<sup>1</sup>, which were built on technologies prevailing more than a decade ago, are becoming obsolete.

5. The current maintenance contract of APPLIES will expire in February 2019. ImmD has made strenuous efforts to secure extension of the maintenance services for another three years until February 2022, despite that it has become increasingly difficult to secure system maintenance and technical support due to limited and dwindling market supply of outdated technologies. Further extension of maintenance services beyond 2022 will not be possible as supply of hardware parts, software updates such as security patches as well as professional support in daily system operation will no longer be available.

6. Without suitable and on-going maintenance and technical support, there is an increasing risk of substantial deterioration of system performance or system failure, which may cause large-scale disruption (e.g. severe delays) or even suspension to the provision of public services by ImmD. Any failure of timely replacement of APPLIES may also threaten information security in the absence of security patches and other software updates. Furthermore, APPLIES was built on technologies prevailing more than a decade ago. Its system design (including hardware and software) has been stretched to its limit and can hardly be enhanced further to cater for growing and new business needs<sup>2</sup>. There is therefore an imminent need for replacement.

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<sup>1</sup> Examples include workstations, servers and operating systems.

<sup>2</sup> ImmD projects that APPLIES will reach its processing capacity limit by 2021.

**Enhancement of Service Delivery**

7. Subject to detailed design in system development stage, implementation of APPLIES-2 will bring the opportunity for service enhancement through, among other things, the provision of new and enhanced electronic services, thereby providing better user experience and bringing greater convenience to users. For example –

(a) Visa applications by electronic means

At present, among visa applications, primarily only applications for extension of stay can be applied electronically due to constraints in existing system capacity. With APPLIES-2, we envisage that electronic applications (from form-filling, uploading of photos and supporting documents, enquiries to payment) for visas may be extended to all applications including entry cases (e.g. student or employment visas), in which applicants are often required to upload a large amount of documents. It will enable users to prepare and submit application electronically at their convenience.

(b) Web-based application forms and electronic notifications

At present, applicants are required to download and fill in application forms in portable document format (PDF). PDF forms are printed, scanned and uploaded for submission. With APPLIES-2, web-based application forms for online data input may be introduced, so as to save the applicants' efforts and time. Besides, electronic notification of application result as well as more options in online payment services may also be provided insofar as feasible.

(c) Mobile applications

With the widespread usage of mobile devices, mobile applications may be developed under APPLIES-2 to extend electronic services to the mobile platform. Applicants may use the services via mobile platform ubiquitously ranging from appointment booking, submission of applications to payment of application fees. They can also submit supplementary documents for assessment as requested by the case officer, check the progress of application and obtain information such as case result through mobile means.

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(d) Self-service kiosks

Self-service kiosks may be introduced to enable members of the public to submit applications and supplementary documents (e.g. the search of birth, death and marriage records, and visa applications), and to collect documents (e.g. search results and visas), without queuing for services over ImmD counters.

### **Enhancement of System Resilience and Communication with Other Systems**

8. Apart from service enhancements, implementation of APPLIES-2 will also bring about the following improvements –

(a) System resilience and serviceability

The new system architecture will provide an additional layer of resilience to enhance system availability, which ensures continuity of business operations as well as public services.

(b) Communication with other ImmD systems

The new Information Technology Infrastructure<sup>3</sup> (ITI) of ImmD was rolled out in July 2015 pursuant to ImmD's third Information Systems Strategy (ISS-3) Review to enable ImmD to re-engineer and re-organise ImmD's existing computer application systems. Systems running on the existing network infrastructure and the new ITI cannot communicate directly. Implementation of APPLIES-2, which is compatible with the new ITI, is necessary to ensure smooth and efficient communication with other ISS-3 systems and avoid unnecessary delay in its daily operation. For example, the visa information in APPLIES-2 may readily be accessed by the Immigration Control System during immigration clearance.

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<sup>3</sup> The new ITI strategically adopts new technologies to pave way for the implementation of the new systems blueprinted under the third Information Systems Strategy Review. It will provide a solid information technology (IT) infrastructural foundation for the next generation of IT-enabled services. A funding of \$862,202,000 was approved on 9 December 2011 for the development of the project vide FCR(2011-12)56.

### **Enhancement of Case Assessment and Management Process**

9. Case assessment and management processes may be streamlined and further automated in APPLIES-2, such as automated validation of eligibility criteria, with a view to expediting application assessment or investigations. APPLIES-2 will be able to provide case officers with a holistic view of each and every case with background, chain of records and progress electronically.

### **Personal Data Privacy Protection**

10. There has been no known case of leakage of personal data stored in APPLIES since its introduction in 2007. That said, ImmD will conduct Privacy Impact Assessments at critical stages of the implementation of APPLIES-2, including system analysis and design stage, and prior to system rollout in order to ensure the data protection principles promulgated in the Personal Data (Privacy) Ordinance (Cap.486) are observed and complied with. Relevant reports will be passed to the Office of the Privacy Commissioner for Personal Data, whose comments will be duly taken into account before the implementation of the systems. In addition, a Privacy Compliance Audit will be conducted after system rollout. ImmD will also engage an independent auditor to conduct information technology security risk assessment and security audit at different stages to ensure the effectiveness of those security measures in protecting information in APPLIES-2.

### **Benefits of APPLIES-2**

11. APPLIES-2 will bring about the following benefits –
- (a) **ensure ImmD’s effective operations and quality services** to the public in the next decade;
  - (b) **enhance service delivery** through various improvement initiatives such as providing electronic means for the submission of visa applications, web-based applications forms, and electronic notification, extending services from web-based platform to the mobile platform as well as introducing self-service kiosks for submission of applications, supplementary documents and collection of documents;
  - (c) **enhance system capability** through strengthening system resilience, serviceability and communication with other ImmD systems. These will ensure the continuity and efficiency of business operations as well as public services; and

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- (d) **enhance case assessment and management process** with a view to expediting application assessment or investigations.

## FINANCIAL IMPLICATIONS

### Capital expenditure

12. It is estimated that the implementation of APPLIES-2 will incur a total capital expenditure of \$452,968,000 over five financial years from 2018-19 to 2022-23. The breakdown is as follows –

Items	(\$'000)					Total
	2018-19	2019-20	2020-21	2021-22	2022-23	
(a) Hardware	-	-	-	85,573	20,543	<b>106,116</b>
(b) Software	-	-	-	69,818	16,643	<b>86,461</b>
(c) Implementation Services and Contract Staff	791	38,960	23,472	80,184	55,536	<b>198,943</b>
(d) Site Preparation	-	1,321	1,321	9,768	684	<b>13,094</b>
(e) Communication Network	-	-	1,081	2,292	1,459	<b>4,832</b>
(f) Consumables	-	-	-	126	2,217	<b>2,343</b>
(g) Contingency	79	4,028	2,588	24,776	9,708	<b>41,179</b>
<b>Total</b>	<b>870</b>	<b>44,309</b>	<b>28,462</b>	<b>272,537</b>	<b>106,790</b>	<b>452,968</b>

13. On paragraph 12(a) above, the estimated expenditure of \$106,116,000 is for purchasing computer hardware, such as system servers, workstations, storage devices, network equipment, self-service kiosks, etc.

14. On paragraph 12(b) above, the estimated expenditure of \$86,461,000 is for purchasing system software and packages, including operating system software, database management software, document management software, system security software, etc.

15. On paragraph 12(c) above, the estimated expenditure of \$198,943,000 is for acquiring implementation services from external service providers and contract staff<sup>4</sup>, including system analysis and design, development, testing, installation and training, etc. It also includes the acquisition of consultancy services to conduct consultancy studies, namely the Privacy Impact Assessments, Privacy Compliance Audit and Information Technology Security Risk Assessment and Audit at different implementation stages of APPLIES-2.

16. On paragraph 12(d) above, the estimated expenditure of \$13,094,000 is for site preparation, including fitting-out works for immigration offices, computer room facilities, etc.

17. On paragraph 12(e) above, the estimated expenditure of \$4,832,000 is for the installation of communication lines.

18. On paragraph 12(f) above, the estimated expenditure of \$2,343,000 is for acquiring start-up consumables, such as data tapes, printer toners, etc.

19. On paragraph 12(g) above, the estimated expenditure of \$41,179,000 represents a 10% contingency on the cost items set out in paragraphs 12(a) to 12(f) above.

### **Other non-recurrent expenditure**

20. The proposed implementation of APPLIES-2 will require a project team for project management, procurement of hardware, software and services, system analysis and design, site preparation, user acceptance tests, implementation support, etc. This will entail a non-recurrent staff cost of around \$170,227,000 from 2018-19 to 2022-23. ImmD will review the staffing requirement as the project progresses.

### **Recurrent expenditure**

21. We estimate that the proposal will entail an indicative annual recurrent expenditure of \$6,022,000 in 2022-23, increasing to \$69,471,000 from 2025-26 and onwards. This covers the cost for hardware and software maintenance, on-going system support services, communication network and consumables. Such requirements will be reviewed nearer the time when the system is commissioned. The breakdown is as follows –

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<sup>4</sup> There will be 1 186 man-months of contract staff service involved in different stages over five financial years from 2018-19 to 2022-23.

Items	(\$'000)			
	2022-23	2023-24	2024-25	2025-26 and onwards
(a) Hardware Maintenance	-	7,989	16,320	16,744
(b) Software Maintenance	-	7,904	15,806	15,806
(c) On-going System Support Services	403	13,248	25,688	25,688
(d) Communication Network	4,413	8,823	8,823	8,823
(e) Consumables	1,206	2,410	2,410	2,410
<b>Total</b>	<b>6,022</b>	<b>40,374</b>	<b>69,047</b>	<b>69,471</b>

### Savings and cost avoidance

22. It is estimated that the implementation of APPLIES-2 will bring about the following cost savings and avoidance upon decommissioning of the existing APPLIES and full implementation of the new system –

- (a) **non-recurrent and recurrent cost avoidance:** To sustain the existing business operation, a one-off provision of \$508,338,000 in 2021-22 would be needed to revamp the existing APPLIES and related service components that would soon become obsolete. A recurrent cost of \$2,551,000 in 2021-22 and increasing to \$42,280,000 in 2031-32, being the additional maintenance cost for the revamped system and staff cost, would be required. These costs would be avoided if the new commitment is approved; and
- (b) **recurrent realisable and notional savings:** A recurrent provision of \$3,959,000 in 2021-22, increasing to \$47,813,000 in 2023-24 and onwards would be needed for the regular maintenance cost of the existing system, cost required for the on-going system support services, procurement of consumables under the existing system and staff costs to sustain existing business operation which could have been enhanced by APPLIES-2. These costs would be saved if the new commitment is approved.

Encl. 23. A cost-benefit analysis for APPLIES-2 is at Enclosure.

**/IMPLEMENTATION .....**



## IMPLEMENTATION PLAN

24. Subject to Finance Committee (FC)'s approval of the proposed new commitment, we plan to implement the proposed project according to the following schedule –

<b>Activity</b>	<b>Target Completion Date</b>
Tendering and Award of Contract for Procurement of Hardware, Software and Services	Fourth quarter 2018
Systems Development and Implementation	
System Analysis and Design	Fourth quarter 2020
System Development and Testing	Third quarter 2021
User Acceptance Test	First quarter 2022
Infrastructure Setup	Fourth quarter 2021
Production Rollout	
VISAS and ABROADS	Fourth quarter 2021
ENCAPS	Second quarter 2022

## PUBLIC CONSULTATION

25. We consulted the Legislative Council Panel on Security on 6 March 2018. Panel Members in general supported the submission of the proposal to the FC for funding approval.

## BACKGROUND

26. ImmD has been strategically adopting information technology to support its day-to-day operations and regularly conducting Information Systems Strategy Reviews to formulate its long-term information systems strategy. The latest ISS-3 Review blueprint encompasses eight strategic information systems in a structured programme. The first and foremost is the new ITI project, which underpins other ISS-3 systems including the Immigration Control System (ICONS), the Next Generation Smart Identity Card System (SMARTICS-2), and the Next Generation Electronic Passport System (e-Passport-2). Implementation of ITI and ICONS has already been completed and that of SMARTICS-2 and e-Passport-2 is underway. For the Human Resources Management System, the preparatory work for a feasibility study is underway.

27. APPLIES-2 includes three systems, namely, VISAS, ABROADS and ENCAPS. Each of them will support different businesses of and services provided to Hong Kong residents and visitors by ImmD. In gist –

- (a) VISAS will support the processing of visa or permit applications for entry into Hong Kong for visit, employment, investment, training, residence and study;
- (b) ABROADS will support birth, death and marriage registrations, assessment of right of abode applications and cases requiring assistance to Hong Kong residents in distress outside Hong Kong; and
- (c) ENCAPS will support the handling of law enforcement cases related to investigation, detention, assessment and removal by ImmD.

28. While the three systems will ride on the new ITI and run independently, they are inter-connected and will share network infrastructure, storage, document management system, common functions for workflows, system monitoring and data processing, etc. They will be designed and developed in one-go with a view to achieving synergy in the utilisation of information technology resources. For example, many of the businesses to be supported by APPLIES-2 require the management of a large amount of document images, such as scanned application forms and supporting documents. The leverage of a common infrastructure can reduce implementation cost and improve efficiency, thereby achieving synergy.

**Cost-Benefit Analysis for the Implementation of the Next Generation Application and Investigation Easy Systems (APPLIES-2)**  
(\$'000)

	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28	2028-29	2029-30	2030-31	2031-32	Total
<b>Cost of the proposed system</b>															
Capital Expenditure	870	44,309	28,462	272,537	106,790	-	-	-	-	-	-	-	-	-	452,968
Other Non-recurrent Expenditure	23,581	40,794	51,948	47,842	6,062	-	-	-	-	-	-	-	-	-	170,227
Sub-total	24,451	85,103	80,410	320,379	112,852	-	-	-	-	-	-	-	-	-	623,195
Recurrent Expenditure	-	-	-	-	6,022	40,374	69,047	69,471	69,471	69,471	69,471	69,471	69,471	69,471	601,740
<b>(A) Total Cost</b>	<b>24,451</b>	<b>85,103</b>	<b>80,410</b>	<b>320,379</b>	<b>118,874</b>	<b>40,374</b>	<b>69,047</b>	<b>69,471</b>	<b>69,471</b>	<b>69,471</b>	<b>69,471</b>	<b>69,471</b>	<b>69,471</b>	<b>69,471</b>	<b>1,224,935</b>
<b>Savings and cost avoidance</b>															
Non-recurrent Cost Avoidance	-	-	-	508,338	-	-	-	-	-	-	-	-	-	-	508,338
Recurrent Cost Avoidance	-	-	-	2,551	11,881	37,981	38,409	38,965	39,478	39,960	40,503	41,066	41,666	42,280	374,740
Recurrent Realisable Savings	-	-	-	2,333	22,967	22,967	22,967	22,967	22,967	22,967	22,967	22,967	22,967	22,967	232,003
Recurrent Notional Savings	-	-	-	1,626	20,019	24,846	24,846	24,846	24,846	24,846	24,846	24,846	24,846	24,846	245,259
<b>(B) Total Savings</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>514,848</b>	<b>54,867</b>	<b>85,794</b>	<b>86,222</b>	<b>86,778</b>	<b>87,291</b>	<b>87,773</b>	<b>88,316</b>	<b>88,879</b>	<b>89,479</b>	<b>90,093</b>	<b>1,360,340</b>
<b>(C) = (B) - (A)</b>															
<b>Net Cost (-)/</b>															
<b>Net Savings (+)</b>	<b>-24,451</b>	<b>-85,103</b>	<b>-80,410</b>	<b>194,469</b>	<b>-64,007</b>	<b>45,420</b>	<b>17,175</b>	<b>17,307</b>	<b>17,820</b>	<b>18,302</b>	<b>18,845</b>	<b>19,408</b>	<b>20,008</b>	<b>20,622</b>	<b>135,405</b>
<b>Net Cumulative Cost/Savings</b>	<b>-24,451</b>	<b>-109,554</b>	<b>-189,964</b>	<b>4,505</b>	<b>-59,502</b>	<b>-14,082</b>	<b>3,093</b>	<b>20,400</b>	<b>38,220</b>	<b>56,522</b>	<b>75,367</b>	<b>94,775</b>	<b>114,783</b>	<b>135,405</b>	<b>-</b>

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